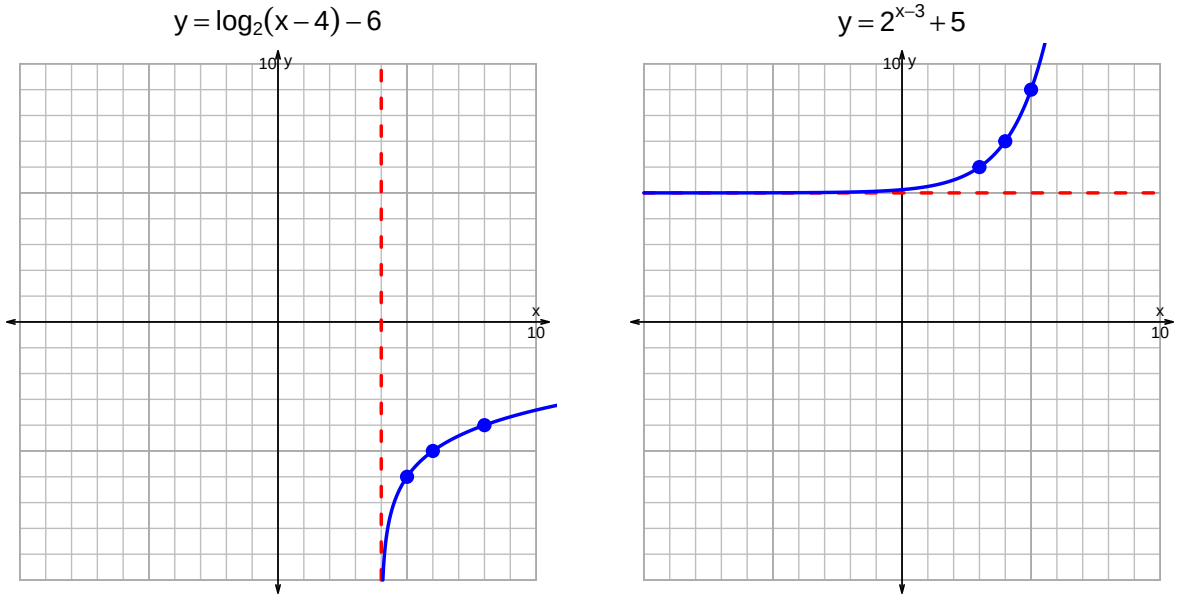
Name: Date:

s18quiz: EXP LOG (Solution v104)

1. Graph $y = \log_2(x-4) - 6$ and $y = 2^{x-3} + 5$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-19 = \left(\frac{-4}{7}\right) \cdot 2^{-3t/5}$$

Divide both sides by $\frac{-4}{7}$.

$$\frac{19 \cdot 7}{4} = 2^{-3t/5}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{19 \cdot 7}{4}\right) = \frac{-3t}{5}$$

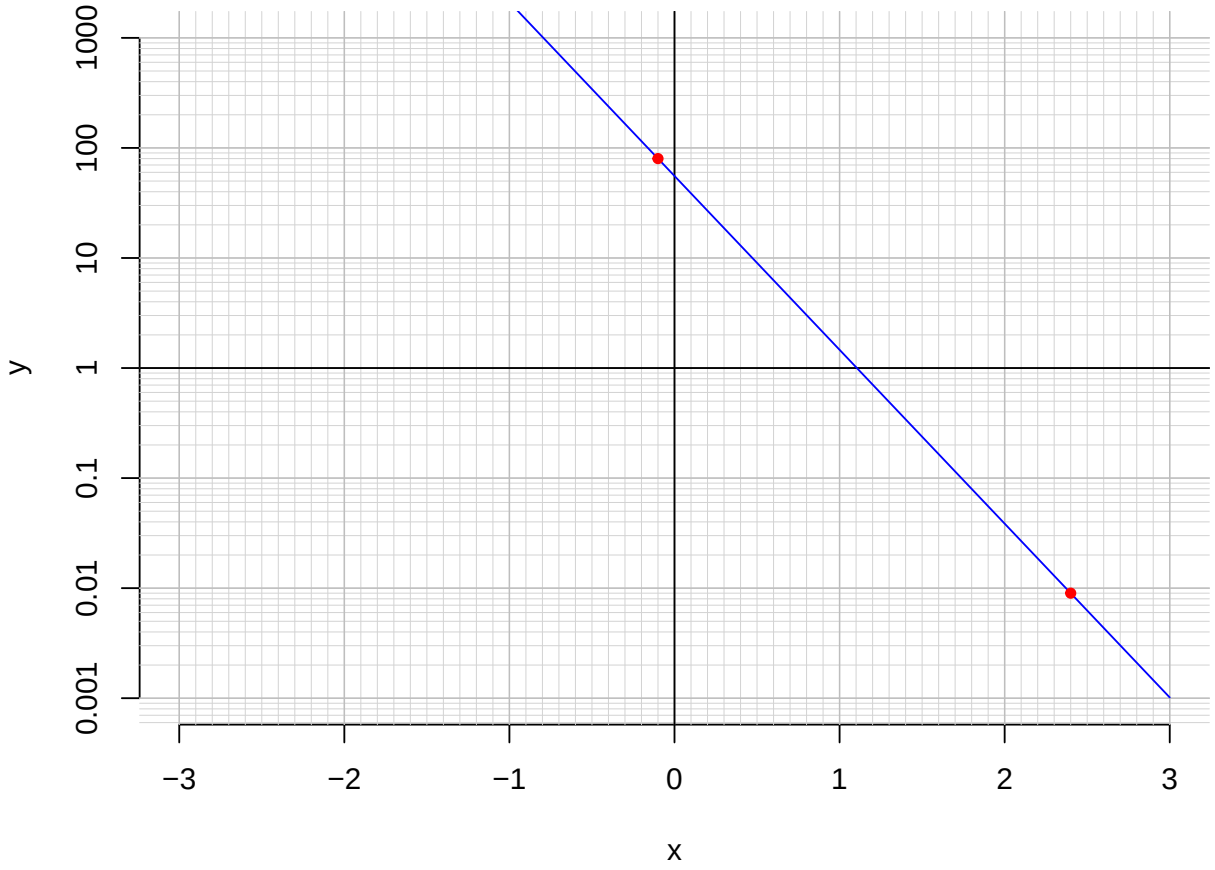
Divide both sides by $\frac{-3}{5}$.

$$\frac{-5}{3} \cdot \log_2\left(\frac{19 \cdot 7}{4}\right) = t$$

Switch sides.

$$t = \frac{-5}{3} \cdot \log_2\left(\frac{19 \cdot 7}{4}\right)$$

3. An exponential function $f(x) = 55.6 \cdot e^{-3.64x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.4)$.

$$f(2.4) = 0.009$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{3.64} \cdot \ln\left(\frac{x}{55.6}\right)$$

c. Using the plot above, evaluate $f^{-1}(80)$.

$$f^{-1}(80) = -0.1$$